

CBCS SCHEME

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18MR36

Third Semester B.E. Degree Examination, Jan./Feb. 2021 Mechanical Measurements and Metrology

Time: 3 hrs.

Max. Marks: 100

Note: Answer any FIVE full questions, choosing ONE full question from each module.

Module-1

- 1 a. What is metrology? What are the objectives of metrology? (07 Marks)
- b. Explain subdivision of standards. (08 Marks)
- c. Define wavelength standard. What are the advantages of wavelength standard? (05 Marks)

OR

- 2 a. Explain the wringing phenomena of slip gauges. (05 Marks)
- b. With a neat sketch, explain the working of sine bar and mention its limitations. (08 Marks)
- c. With a neat sketch, explain the working of auto collimator. (07 Marks)

Module-2

- 3 a. Explain the principle of inter changeability and selective assembly. (08 Marks)
- b. With neat sketches, explain different types of fit. (07 Marks)
- c. State and explain Taylor's principle of gauge design. (05 Marks)

OR

- 4 a. Define Comparator. What is the need of a comparator? (05 Marks)
- b. With a neat sketch, explain dial indicator. What are the advantages? (07 Marks)
- c. Sketch and explain the working of LVDT. (08 Marks)

Module-3

- 5 a. With a neat sketch, explain screw thread terminology. (06 Marks)
- b. Derive an expression for best wire size for screw thread measurement. (07 Marks)
- c. With a neat sketch, explain the working of tools maker's microscope. (07 Marks)

OR

- 6 a. With a neat sketch, explain gear tooth terminology. (08 Marks)
- b. Explain measurement of tooth thickness by gear tooth vernier caliper. (07 Marks)
- c. Explain with neat sketch Rolling gear test for composite error. (05 Marks)

Module-4

- 7 a. Explain generalized measurement system, with block diagram. (07 Marks)
- b. Define:
 - (i) Accuracy
 - (ii) Threshold
 - (iii) Calibration
 - (iv) Hysteresis
 - (v) Error (05 Marks)
- c. With the help of neat sketch, explain the following mechanical transducer:
 - (i) Bourdon tube
 - (ii) Diaphragms (08 Marks)

Important Note : 1. On completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages.
2. Any revealing of identification, appeal to evaluator and /or equations written eg, 42+8 = 50, will be treated as malpractice.

OR

- 8 a. With a circuit diagram, explain Ballast circuit. (06 Marks)
b. With a neat sketch, explain stylus type Oscillography. (06 Marks)
c. With a neat sketch, explain Cathode ray Oscilloscope. (08 Marks)

Module-5

- 9 a. With a neat sketch, explain working of prony brake dynamometer. What are its limitations? (10 Marks)
b. With a neat sketch, explain McLeod gauge. (10 Marks)

OR

- 10 a. Define strain gauge. With a neat sketch, explain Wheatstone bridge circuit. (10 Marks)
b. Define thermocouple. State the laws of thermocouple and explain. (06 Marks)
c. Write notes on:
(i) Thermocouple materials
(ii) Advantages and disadvantages of thermocouples. (04 Marks)
